M. Meyer (S. B. Akad. Berlin, 1882, 547) has also taken up this subject, apropos of a Moluccan parakeet (*Eclectus polychlorus*) which, though certainly undomesticated, had certain citron-yellow plumes where the usual color is green, blue, or black—a peculiarity which can be produced artificially upon birds kept in captivity. Thus the Indians of South America pluck out the feathers of parrots, and treat the new roots with the milky secretion from the skin of a small batrachian, with the result that the new growth of feathers is yellow. The aborigines of Gilolo, by giving animal food to *Lorius garrulus*, transform its plumage into that of the *Lori rajah*. The natural color returns after an exclusively vegetable diet. The green color so common in birds is due to an admixture of a yellow pigment (*Psittacofulvine* Krukenberg) with a dark brown one; and Herr Krukenberg states that no blue, white, or green pigment can be found among the parrots. He believes that all the darker pigments are derived from one substance, probably identical with Coriosulphurine, which is thus the most widely spread pigment in birds' feathers. ——The spring birds of Nebraska are enumerated, with notes, by A. Hall in *Forest and Stream*.——Mr. H. F. Osborn gives in *Science*, for May 25, the results of an examination of the fœtal membranes taken from a female opossum which had been captured within a few days after impregnation. From this and other specimens and facts, Osborn concludes that the so-called false chorion of some of the lower placental mammals in the marsupials functions as a true chorion, *i. e.*, the functions of the allantois in the placental mammals are, in a rudimentary way, performed by the yelk-sac in the marsupials. "Finally, some genera of the marsupials probably show the attachment of the allantois to the subzonal membrane, which is the first step towards the establishment of an allantoic placenta."

PHYSIOLOGY.[1]

Locomotor System of Medusæ.—Mr. G. J. Romanes concludes his observations of the locomotor system of Medusæ—observations which throw a new light upon rhythmic action generally. He believes rhythmic action to be a primary endowment of contractile tissue, the excitability of which under the constant stimulation of the element it exists in is alternately exhausted and restored. The action of ganglia is superimposed on this, and is timed so as to coincide with the normal pulsatile action of the muscular tissue. Muscular tones he attributes to a higher irritability in the structure than is possessed by rhythmic tissues.

The Origin of Fat in the Body.—In Pflüger's Archiv, Bd. 31, P. II, Dr. Lebedeff tries to show that the common view that fat may arise in the body as a decomposition product of albuminous matter, is erroneous. Dead bodies, under certain condi-

[1] This department is edited by Professor Henry Sewall, of Ann Arbor, Michigan.

tions, seemed to have their nitrogenous tissues replaced by a fatty substance, adipocere. In phosphorous poisoning the nitrogenous tissues, particularly the liver, undergo a fatty degeneration. It is usually taught that the fat arises in these cases from the decomposition of tissue proteid, but Lebedeff seeks to prove that the fat found in the "degenerated" organs has made its way to them from the surrounding connective tissue, out of which it has been dissolved, to be again laid down in a less soluble combination. The disappearance of the proteid matter is due to an independent disintegration. The fat of the milk is not made by the protoplasm of the mammary gland cells, but comes ready formed to them from the blood. The view of nutrition, according to which proteid food by its physiological decomposition gives rise to fat in the body, has little experimental support.

THE FORMATION OF MILK.— Schmidt-Mühlheim denies the truth of the view that the formation of part of the milk obtained from a cow begins only with the process of milking, and that the udder is too small to accommodate all the fluid which may be obtained at one milking. The secretion as it is produced in the gland cells of the udder is forced gradually into the milk receptacles, but leaves much of its fat clinging to the walls of the gland ducts whence it is gradually washed off during the process of milking, hence the milk which is last drawn is richest in fat; there is no evidence, however, that the chemical proportions of the fluid vary with different periods of secretion. Even after the most thorough milking, some fluid still remains in the milk ducts, whence it is driven into the milk reservoirs by the newly formed secretion pushing from behind, and may then be obtained after the lapse of an hour.

INTERACTION OF THE SPINAL NERVE ROOTS.— Mr. Kanellis lays bare the spinal cord of a frog and divides all the nerve roots upon one side except a single pair. He then lays the anterior or motor root of this pair upon electrodes, and finds the strength of the electrical current, which is just too feeble to excite a muscular contraction. He then cuts the sensory root of the reserved pair and finds that the induction current now causes strong contractions when applied to the anterior root. It seems from the result as if cutting the posterior root had increased the irritability of the motor branch.

CHEMICAL DIFFERENCE OF LIVING AND DEAD MATTER.—O. Loew concludes, as the result of a long series of experiments, that it is only the albumen of the living cells of tissues that is capable of reducing silver salts, and therefore that the albumen is chemically changed in the death of the protoplasm of which it forms a part.

NUTRITION OF THE FROG'S HEART.—* * * In the non-vascular frog heart two groups of muscular fibers with different

action must be distinguished. The one class of fibers surrounds the fissures of the heart-wall, which perform the function of the vessels and admit the nutritive liquid to the tissue (vessel muscles); the others, by their regular contractions and dilatations, act in the way of moving the blood (proper heart-muscles). The contraction of the first kind of muscles closes the fissures and produces paleness of the heart-wall, and their dilatation opens the fissures, lets the blood penetrate into the substance of the heart, and reddens the heart-wall; while the action of the second group of muscles produces systole and diastole of the heart. Now the actions of these two kinds of muscles—the heart-vessel muscles and the proper heart-muscles—are not simultaneous and similar under the influence of local stimuli, removal of the brain, section of the spinal cord in different places, and poisons; sometimes the heart-walls were observed to be pale in diastole and deep red in systoles, and there were various other local differences of behavior. This led the author to seek also an anatomical difference of the two groups of muscles, and he found one such on microscopical examination, for the proper heart-muscle fibers were cross-striped throughout and had long cell nuclei, whereas in the others the cross-striping did not comprise the whole width of the fibers, and the nuclei were oval. With this anatomical difference the different mode of reaction of the two kind of muscles and their different function is intelligible.—*Nature.*

Effect of prolonged Hunger upon the Blood Corpuscles. —In May, 1881, a Mr. John Griscom, of Chicago, commenced a fast of forty-five days. The author (Lester Curtis, of Chicago) was invited by the "managers" to make any investigations that he pleased, and after satisfying himself that the fast was to be conducted honestly, he chose the blood as a subject of study. The first examination made, at the commencement of the fast, shortly after the patient had eaten his last meal, showed the red corpuscles abundant, bright-colored, pure in appearance, regular and smooth in outline. Four days afterwards two kinds were noticed, one pale, almost colorless, large with a "sticky" aspect, the other deeper in color than the ordinary corpuscles, smaller and covered with nodules. By the fifth day the colorless corpuscles had disappeared, but they returned in a few days, and continued in greater or less amount to the end. The darker corpuscles assumed various shapes, and many very small ones appeared, apparently by subdivision of the larger. Their aspect was most abnormal on the thirty-ninth day of the fast, when Mr. Griscom was extremely exhausted; but on the fortieth, after he had been refreshed by a rather long excursion on the lake, the corpuscles returned to a normal condition, except as regards size. This improvement was not lost during the remainder of the fast, though the abnormal appearance to some extent returned.—*Nature.*

PSYCHOLOGY.

THE ENGLISH SPARROW IN CANADA.—My first observation of the English sparrow in Canada was in 1874. In June of that year a pair was observed about the out-houses, and in a few days they became quite familiar, having evidently made up their minds to stay with us. I made them welcome for old acquaintance sake, and thinking they would make good settlers was about to put up a house for them, but before my well-meant intentions were carried out it became apparent that they were providing for themselves in a manner quite characteristic.

On a peak of the stable was a box occupied by a pair of swallows who were at this time engaged in rearing their young, and of this box the sparrows seemed determined to get possession. The swallows resisted their attacks with great spirit, and, their outcries bringing a host of friends to their assistance, the intruders were for a time driven off, but it was only to return again with renewed energy and perseverance. The swallows were now sorely beset, as one had to remain on guard while the other went in search of supplies. Still they managed to hold the fort till the enemy, watching his opportunity, made a strategic movement from the rear and darted into the box, quicker than I can tell it. He emerged again with a callow swallow hanging by the nape of the neck in his bill, and dropped it on the ground below, and soon another followed, amid the distressing cries of the swallows who, seeing their hopes so completely blighted, sat mute and mournful on the ridge of the house for a short time, and then went away from the place, leaving the sparrows in undisputed possession of the box, and there they remained and raised some young ones during the summer.

In the spring of the following year the numbers had increased, and they began to roost under the veranda round the house, which brought frequent complaints from the sanitary department, and a protest was made against their being allowed to lodge there at all. Still, in view of the prospective riddance of insect pests from the garden, matters were arranged with the least possible disturbance to the birds, and we even stood by and saw them dislodge a pair of house wrens who had for years been in possession of a box fixed for them in an apple tree in the garden. So the second year wore on, no farther notice being taken of the sparrows except that they were getting more numerous.

I had missed the sprightly song and lively manners of the wrens, and in the spring when they came round again seeking admission to their old home, I killed the sparrows which were in possession in order to give the wrens a chance, and they at once took advantage of it and commenced to carry up sticks in their usual industrious manner. They had only enjoyed possession for two days, however, when they were again dislodged.

Again the intruders were killed off, and domestic felicity reigned for three days, when a third pair of sparrows came along, bent on the same object, and, if possible, more overbearing and determined than their predecessors. This time I thought of a different mode of accomplishing the object in view, and taking down the box at night, nailed a shingle over the end and worked it flush round the edges; with a centre bit a hole was then pierced just large enough to admit the wrens, but too small for the sparrows, and the box put back in its place. Early in the morning the assault was renewed, but the wrens found at once that they were masters of the situation, and never were two birds more delighted. From his perch aloft the male poured forth torrents of scorn and ridicule, while the female inside the box fairly danced with delight, and I almost fancied was making faces at their enemy as he struggled ineffectually to gain admission or sullenly, but fruitlessly, tried to widen the aperture.

Shortly after this dispute was settled I noticed ten or twelve sparrows quietly at work at the grave vine, and, feeling pleased at the havoc they were apparently making among the insects, passed on, speculating mentally on the probable increase of fruit I would have. In the afternoon they had moved to another trellis, and I thought, "Well, they are doing the work systematically and, no doubt, effectually." But shortly afterwards, while passing the trellis where they commenced, a slight *débris* of greenery was observed along under the vines. This led to an examination, which showed, to my intense mortification, that the heart had been eaten out of every fruit bud where the birds had been, and nothing left but the outside leaves. The report of firearms was heard several times in the garden that afternoon, many dead and wounded sparrows were left to the care of the cats, and every crevice where the birds were known to breed closed up at once.

Since then the wrens have kept possession of their box, and with a little attention I can keep the sparrows out of the garden, as they find plenty of provender round the stables; but they are still on the increase, and if this continues in the future as in the past, the time is not far distant when the streets and stable yards will not furnish food enough for the increased numbers, and there is no question but they will then betake themselves to the fields and gardens and take whatever suits them. This is the serious view of the subject which has called for legislation in other countries, and may do so here unless some unexpected check arises to prevent the necessity for it.

In the mean time it is well that all parties having opportunity should take notes of the movements and increase of the birds for future consideration.—*T. McIlwraith. Hamilton, C. W.*

Instinct or Reasoning Powers in the Horse.—Not long since a fine blooded mare was brought here from Kentucky and

placed in pasture, and the owner, not expecting her to foal, took no particular care of her.

A couple of days ago she foaled while in the pasture and surrounded by many other horses, which made so much over her difficulty that she, being frightened, ran, with her weakling following after as best she could, in hopes to shelter herself and offspring from the torments of the herd.

In her excitement she made for the Floyd, a stream running through the pasture, some thirty yards in width, which she plunged into and swam to the opposite shore; the colt following, but lacking strength, did not succeed in leaving the stream, but with great tenacity of life clambered into some willows which grew on shore, and there remained, apparently "hanging on for dear life."

The mother, having discovered her error in getting the colt into such a position, either by "instinct" or a conclusion of mind, at once started for help, by swimming across the stream, and at full speed ran to the barn-yard some distance away where some men were at labor, and with furious neighing and other actions, like mad, attracted the attention of the workmen who, when they noticed her particular desire that they should follow her—by her showing great joy when they did—went to the stream and rescued the colt.

The mare showed them great kindness until she had recovered her offspring, when she became instantly very vicious and would not allow one of the rescuers to approach her.—*D. H. Talbot.*

How Snakes approach and swallow their Prey.—Speaking of snakes and their elastic throat capacity, it occurs to me that sixty years as naturalist and half a century as taxidermist would most likely bring several points of interest under an eye not totally blind. By practice a man will sit or stand motionless longer than he can at first believe possible, and it is only when this art is acquired that animals are fully over-reached. They seem to recognize life in a great measure only by motion.

I have had a creature touch my coat with his nose and pass on only a little suspicious. I have had a humming bird hang suspended within a foot of my own nose for half a minute looking me squarely in the eye, and as I did not even wink, return to flowers within an arm's length, with the very proper conclusion, "You look like a man, but I believe you are only an old stump."

Snakes approach their victim like the hour hand of a clock. There is no perceptible movement. One little spot of the body moves, while all the rest is fixed. The head moves by an impetus from the tail perhaps, and when striking distance is reached the muscles are gathered for the final spring. This is made with no regard to what part of the object is reached. If a frog is caught, as is often the case, by a hind leg, that leg goes down first, while the body follows in a bunch. If a snake catches a

neighbor by the head, as the water snake lately referred to was caught, he goes down head first; if caught by the middle, as I once knew to be done, he is swallowed double, and in this case the swallower was but six inches longer than the swallowed. The seven red squirrels I took from the body of my black snake followed each other head first, a most positive evidence of fascination, since it is hardly possible that such unbroken succession could be the result of any other process. But the snake is not the only creature that swallows "big things." I once cut from the throat of a hawk the foot, leg, shoulders, and shoulder blade entire of a muskrat. I once took from the neck of a merganser a sucker thirteen inches long whose head girth was double that of the duck. I cut from the throat of a heron a chicken as large as a woodcock, and sat almost an hour as "crowner's quest" before it got through my thick skull what those soft yellow feet and bill belonged to. This capacity for extension is common among birds and reptiles, owing to the flexibility of the posterior connection of jaws or mandibles, they being held together by muscular contraction, and not by articular joints as in mammals; distention does not produce dislocation.—*B. Horsford in Forest and Stream.*

BATTLE OF RAVENS.—The *Frankfurt* (Germany) *Journal* writes: The gardener, Mr. Georgius, from Ginnheim, called at our office today with a chest full of dead ravens, victims of a battle which was fought high in the air among a flock of over four hundred of these birds near the above-mentioned village. The ravens formed together into three detachments, and as if at a given signal flew at each other, and with savage cries seemed as if they would tear each other's eyes out or their heads off with their beaks. The ground was soon covered with the bodies of over fifty birds, which were picked up by observers. Wounds on other parts of the body except the head could not be found. The blows on the head appeared on close observation to have been given with such force that one was sufficient to destroy life. The cause of the battle was doubtless the fact that the pairing season of the birds was near at hand. Not only the males but also the females participated in the fight, as bodies of the latter were found among the slain.

ANTHROPOLOGY.[1]

THE SOCIETY OF AMERICANISTS.—The Congrès International des Américanistes will be held in Copenhagen, 21–24 August, under the patronage of Christian IX. Letters should be addressed to M. W. A. Carstensen, general secretary. All persons interested in early American history, by paying twelve francs, may become members, and will receive the published volume. The sum should be remitted to M. Tietgen, directeur de la Banque privée

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